FORMER NEBRASKA ORDNANCE PLANT
RAB MEETING JULY 13, 2006
QUESTIONS AND ANSWERS

Page/ Line #	Speaker	Question	Responder	Initial Response	Follow-up Response
11/15	Moorer	Do you have a version of the time line in the print as large as the narrative of the site management plan?	Anderson	Well, we can print that out in much bigger fashion.	Large print schedules were sent to Lynn Moorer and Dave McReynolds on 17 AUG 06.
13/24	Moorer	Why don't you tell us what AOP means?	Anderson	AOP is advanced oxidation process. It's a chemical process where we have oxidizers that are introduced into the pipeline with the contamination, and the time that it takes the contamination to travel from the extraction well to the treatment building, a chemical reaction occurs so that the contamination is knocked down and destroyed.	
16/11	Moorer	Mr. Leibbert, are you going to tell us more about your findings in June; that is, this June sampling event findings before --	Leibbert	….. if you look at the slide it said the data results are anticipated to be finalized in October of this year. So we sample -- collect samples in June, we send them to the lab, they do their analytical work, we receive the results, we evaluate those results, we publish a report, and that usually takes about 90 days, and if you remember, that's kind of what we talked about in the past.	At the December 2005 RAB Meeting, the Co-Chairs agreed to shift the RAB schedule out one month to coincide with the release of the most current groundwater monitoring data. Since the process of sample collection, laboratory analysis, data review/validation, and publication takes approximately 90 days, the Army will report

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					discuss at the RAB data collected three months prior. Data will be posted on the project web site and placed in the Mead library prior to the RAB meeting.
17/1	Moorer	I'm just wondering, are you able to tell us anything substantive other than just we tested this many? I'm asking were there any significant findings, that's what we always would like to hear from you each RAB meeting.	Leibbert	The sampling that was collected on June 20th, no, we do not have the results yet.	See follow up response above.
19/21	Blasnitz	On the detections for surface water for TCE, what's the standard or are there surface water -- you know, like there are for the drinking water?	Leibbert	This has been a question at the site for a while now, what's the appropriate standard. The state of Nebraska does have a surface water quality standard for TCE in surface water in the state of Nebraska, and that standard is set at 810 parts per billion. So the difference between that sort of standard versus the cleanup standard that we have at our site, our standard is a drinking water standard, and that is set at five parts per billion of TCE. So what the state of Nebraska has determined is that surface waters, something like Johnson Creek, that's not a drinking water supply, you know, it's acceptable to have slightly higher concentrations as opposed to the drinking water standard, excuse me. So the state is saying basically you shouldn't be drinking this water, but 30 parts	

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				per billion, 50 parts per billion doesn't pose an unacceptable risk. In addition to the surface water quality standard, we're doing our own evaluation with -- with EPA, and the state DEQ, Nebraska Department of Environmental Quality, is also doing kind of a similar determination to see if a different standard should be applied at this site or not, and that's in progress right now. We've been working on it.	
21/9	Blasnitz	I wondered why are they thinking there's a different standard that needs to be required?	Leibbert	The state standard that Nebraska defined is based on aquatic life, so it's looking at organisms and things that actually live in the surface water. What we're doing with EPA is we're looking at different exposures. Johnson Creek, you know, you guys that live here know that Johnson Creek sometimes doesn't carry a lot of water, but the point is that when we look at these kinds of sites, we look at what would happen if someone were swimming in Johnson Creek and what would their exposure be and would this level of contamination result in any sort of unacceptable risk to that person, or if this person was fishing Johnson Creek, what would the risk to that person be. So that's the evaluation that we're working on with EPA, that the state surface water quality standard doesn't exactly take all that into account. Their standard is based on organisms and things that would live in the surface water, and that's how they come up with their number.	Because there is not a regulatory established level for surface water, the Army, EPA, and NDEQ have each developed a proposed surface water level specifically for this site. The three agencies are working on a way to present these levels in a meaningful way and show where current levels of DoD contaminants fall within the range of values.
27/1	Luetkenhaus	How about below action level detection for TCE on	Leibbert	No, it hasn't, that's what this outline is. This is the below action level, so this is the less than five parts	

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		the eastern edge. Has it changed since 1997?		per billion for TCE, and then the blue one is the less than two parts per billion for RDX in ground water.	
27/9	Luetkenhaus	You've told us before that those lines were at action levels and now you're saying they're below action.	Leibbert	This line -- what we're saying and we've always said is that what we think -- we think that ground water inside this line is above action level, and that's what these results tell us, and if you're outside this line you're below action level.	
27/18	Luetkenhaus	That's what I'm saying, has -- when you're outside of the line, has that changed since 1997?	Leibbert	No, it hasn't	
27/22	Luetkenhaus	Do you have a map that shows that?	Leibbert	This is probably the most confusing figure of all, this is this old outline on top of this new outline and it -- to try to show where the differences are. The difference on this side is very small. There is some difference in here, and I know it's hard to see, but this is the old line and this is the new line. So to answer the question, has the extent of contamination the way we -- the way we understand it, has that changed, and the answer is no. For this TCE plume on the eastern perimeter it hasn't changed significantly. What's going on in here, yes, that's quite different, but that's less critical. That's all university property, you know, there's no residents living there.	
28/17	McReynolds	How about RDX and -- even at a low level, how far east is it compared to your old 1997.	Leibbert	This is the way we showed it in '97, this green outline, which you can see covers quite a large area, and that's what we had determined to be contaminated with RDX above the action level of two parts per billion. Now, based on -- just based on these results and these results alone, it looks	

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				something like this. It's much smaller in area. And then there's this big gap where there doesn't seem to be any RDX contamination based on these results, and there's a little bit here and then there may be some more over here, so it's quite different than what was determined in '97.	
29/9	McReynolds	You still haven't answered my question for low level; is it farther east than it used to be? You've talked about contamination, but you don't -- you don't say how far it is at a low level, is it farther east?	Leibbert	Well, this outline is based on the action level of two parts per billion, so, again, what we think, based on these results, is that if you're inside the shape there's contamination above two parts per billion RDX, and if you're outside that shape there's contamination less than two per billion, which is below the safe drinking water level, which is below our cleanup levels for this site.	
29/23	McReynolds	Yeah, I understand that and I -- but you won't -- you won't draw the line out there how far it is and if it's gone any farther east even at the low level.	Leibbert	Well, a lot of these are nondetect, that's why they don't show up here. RDX was not detected at many of these locations. These are the only locations where RDX was detected above the action level of two parts per billion.	
30/23	Moorer	I think the issue that perhaps both of you are missing, Mr. Leibbert and Mr. Anderson, is that we're asking for a map that shows a progression, showing how this -- your latest findings have changed as compared to the last sample as compared to the sample before that or perhaps on a	Anderson	If you look at the map on the lower right, it does show the comparative analysis between what originally was drawn in 1997 and the results that we have from our direct push investigation. That's -- it's a very a good depiction, and I think it'll answer a lot of questions.	At the October 26, 2006 RAB Meeting, the Army will brief from a revised large wall map that will present a comparison of the most current investigation and routine quarterly sampling results to the previous depiction of the plume as it was

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		semiannual basis. Mr. Luetkenhaus specifically asked you for that type of delineation at each meeting. At the last RAB he asked for that, so we keep asking this. We want to see a comparative difference each time to have an idea, and it's not just at the action levels, it's anything, any detects of the contaminants.			known in 1997.
34/17	Blasnitz	I guess not being at all familiar with everything over the years, when you did that comparison from '97 to now, basically is that something where you took more samples than you normally do to get that kind of data, and is that something then that you do every so many years, or how does that work?	Leibbert	It doesn't happen on any sort of fixed schedule like every five years we go out and do this kind of thing again. The short answer is that, yes, the work that was done in '97 was spread out over the entire site. I didn't mention it, but these figures don't actually include Load Line 1, which is over here on the west side. This is Load Line 4, 3, 2, and then 1, because we didn't do any work over there as part of this effort. So this effort was highly concentrated on this part of the site, and the objective was really to get that -- this -- to determine if this is an accurate depiction of the extent of TCE contamination on the eastern side. And, again, there's more work that needs to be done to cover the rest of the site to see if -- you know, like this is a pretty significant change in the extent of the RDX contamination compared to this, and we need to go determine if we see similar changes over here on the western side of the site. It's in the site management plan, it's	

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				-- I can't remember exactly when it's scheduled to start, but that's something that is on our plate to do over the next couple of years, is to keep doing this kind of investigation all the way across the whole site.	
36/3	Kolb	And I noticed on one of our pieces of ground that is directly -- where the push sample was taken directly east of EW-1, is that --that is 2905, is that contamination going to be drawn into EW-1 or is it just going to kind of filter on down south?	Leibbert	Sample result at Location 2905, yes, it's in -- within the hydraulic influence of EW-1, and EW-1 will be able to capture that in the future.	
36/13	Kolb	Even though it's straight east, it's going to backtrack?	Leibbert	I'm fairly confident in saying that, yes, that shouldn't be a problem. That kind of talks about the subject of containment evaluation and is the extraction well system capturing everything it's supposed to, which is the subject of more slides later on in the presentation, so we'll get to that.	
36/22	Kolb	Then on 3004, which is south of that one aways, there's a hit of a level of two on that one; is that -- and that's not going to backtrack a quarter of a mile I'm sure. I know two is only a two, but are you just going to let it go or is it just going to keep building? It's 3004 at 20	Leibbert	Harold, I think the result you're talking about is two parts per billion of TCE, which is below that safe drinking water, the five parts per billion TCE, which is what our cleanup at this site is based on. So concentrations that are less than the safe drinking water level are -- do not pose an unacceptable risk to anyone, and that -- you're right, it's probably outside the hydraulic capture zone of EW-1, and it's not subject to cleanup.	

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		feet.			
37/14	Kolb	When will you test at that same location again to see if that two is changing to a three or staying at a two or what?	Leibbert	That is a very good question because where do we go from here? Where do we go from here is we'll be installing a number of new monitoring wells along this eastern boundary so we'll able to do that kind of analysis in the future to see if these results change significantly over time. And, again, that's part of more slides later in the presentation; I think we'll get to that. There's also a monitoring well, MW-62, which is very close to that exact same location that you're talking about, Harold, and that monitoring well is routinely nondetect.	
40/17	Luetkenhaus	Did I understand you to say that there -- 1,4-dioxane was nondetect?	Leibbert	The sampling -- we don't sample for that because it's not a DOD related chemical, but when EPA did their split sampling with us, they did that analysis, and they found -- well, I believe they were all nondetect for 1,2-Dioxane.	Marquess (41/6). EPA sampled at one, two, three, four, five six different well clusters, monitoring well clusters within the plume. We sampled at 21, and 24, 31, 32, 34, and 43, and those were all nondetect for the 1,4-dioxane and were perchlorate. From last night the results we talked about were at -- the university's landfill was where the detections were, up here, we're down gradient of that.
41/18	Moorer	Where are the EPA's	Marquess	They haven’t been [published].	

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		results published?.. for dioxane,			
41/23	Moorer	When will they be published?	Marquess	Before the next RAB meeting. I'm not sure in what format or form, maybe we'll put them up on the Corps' web site, or I don't know, I haven't quite figured out how to do that.	Results of EPA's sampling results for dioxane and perchlorates are posted on the project web site: http://www.nwk.usace.army.mil/projects/mead/Sampling_Results/MAR06_EPA_Perchlorate_-_Dioxane_Sampling.pdf
42/3	Moorer	And accompanied by a map, so something that would allow the location to be --	Marquess	Right, it would be the same wells as here, so the IDs would be included.	
46/13	Konecky	You just said that documents have been turning up missing?	Anderson	Correct	
46/16	Konecky	Which documents are those specifically?	Anderson	I don't have specific ones right now, but we go back from time to time and there's -- sometimes we have to replace documents that have come up missing, so this is a way that we can ensure that there's always a complete set at the library, that they're always accessible.	Over the years, the Army has conducted periodic inspections of the repository, keeping the document files as complete as possible by replacing missing documents when necessary. The Army is not interested in the causes of missing

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					documents but only to keep the files complete. We have not kept a tally of these missing documents, merely replacing them as quickly as possible. As such, there is no list of specific documents that have been replaced over the past fourteen years. The Army has worked closely with the library staff for many years and holds them in the highest regard, appreciating their assistance in maintaining the project files for the citizens of Mead.
46/24	Konecky	About how many documents have been missing since -- you know, since you started checking?	Anderson	I couldn't give you a number off the top of my head.	The Army has made a number of improvements to ensure information and documents are kept current and available at the Mead Library and the project web site. -All documents and data are available on a publicly accessible

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					computer placed in the library. -Hard copies of important milestone documents required by CERCLA (Remedial Investigation Reports, Feasibility Studies, Proposed Plans, Records of Decisions, Remedial Designs, and Remedial Action Reports) will be maintained on the shelf. -Hard copies of periodic data reports will be maintained for one year. Data reports from previous years can be found on the computer. -Hard copies of RAB transcripts and DVDs will be maintained on the shelf for one year. Previous year transcripts and videos can be found on the computer. -The Army will keep the project web site as current as possible.

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					http://www.nwk.usace.army.mil/projects/mead/projectindex.html Key information on the web site includes -12 months of sampling data -Transcripts, presentation slides, and questions/answers from the previous four RABs. -Current Site Management Plan -Site map -Agency addresses The Army will notify community members via email when new documents are placed in the library or posted on the web site.
61/1	Luetkenhaus	Now, this ground water model, is that your in-house model or MUD's model?	Leibbert	That's our model that we placed.	
62/1	Angle	Question on the surface water sample that was done: Of course, it's showing up at SW-10; when was the last time SW-13 was sampled,	Leibbert	We do all of them…. but we'll check the database and make sure that's correct.	

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		which is further downstream?			
62/14	Angle	The reason I ask is, of course, TCE tends to volatilize off and it'd be interesting to see if there's any present in SW-13	Leibbert	I can say that SW-13 has been sampled in the past and in the past it's been nondetect every time we go to look for it. And I believe the same thing is true about SW-12; I think every time SW-12 has been sampled it was nondetect or below action level, but I'd have to look at the data to make sure that's completely accurate.	Leibbert (67/14) Brady has the answer to Larry's question about surface water sampling results. Surface Water 13 was last sampled in 2004, it was nondetect; SW-12, which is up gradient, but outside the extent of contamination, was sampled a few months ago in March, and it had a reported value of .9 PPB TCE, and that was also J flagged. I want to say SW-12 is one of our regular ones.
63/9	Luetkenhaus	Is Extraction Well 13 operational now?	Leibbert	13 is not in service. EW-12 is pumping at a rate of 325 gallons per minutes. EW-13 was installed, we drilled it, we installed the extraction well, we put a pump in there, started to pump it and found out that it didn't produce as much water as what we thought it was going to produce, so since then it's been out of service. We're looking at that right now trying to decide if EW-12 is going to do the job all by itself, which all indications are is probably true, maybe we don't need Extraction Well 13 at all, but that's something that's in progress right now and again will be	

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				reviewed by EPA and DEQ.	
63/24	Luetkenhaus	Okay. And who did your initial engineering on that, in-house or did you have someone else do it?	Leibbert	That design was produced by our engineering firm, URS Corporation.	
64/4	Luetkenhaus	Okay. And if it required 500 gallons a minute as I recall a slide about -- I'm going to guess about two years ago, you with figuring on the water goes past those wells and you were going to suck it back into the wells and run it through the filter plant, correct?	Leibbert	Basically	EW-12 and the associated treatment facility are undergoing the required initial one-year evaluation process. During this time, all aspects of operation, maintenance, hydraulic influence and chemical sampling are assessed to determine overall effectiveness of the system. At the end of this period, the Army will prepare a report describing the system operation and any modifications if necessary.
64/11	Luetkenhaus	Okay. Now, if they said you needed 500 gallons a minute running through that filter plant to suck all this contamination back into it, how are you doing that at 325 gallons then?	Leibbert	That initial flow rate was a prediction, so what we found was that – so far what we found since this has been operational is that EW-12 is actually working better than what we predicted in terms of it generates a larger hydraulic capture zone than what was originally predicted as part of the design. So that's where we're at right now, is we're trying to collect enough data. It's only been operating since	See response to 64/4 above.

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				February, so it's only a few months. The best way to make that determination is to go for, you know, six or nine or twelve months to see if there's any sort of variation, any sort of seasonal effects, but all indications are right now this EW-12 is doing a pretty good job all by itself, and we may not even need EW-13.	
65/7	Luetkenhaus	So in the future we're not going to get a surprise that that plume has moved farther downstream, more south?	Leibbert	Well, maybe you've already seen some of the reports that we've published. We've seen detections of TCE on the south side of EW-12 and 13. The question is, are those being contained within the hydraulic capture zone generated by EW-12. That's also in progress. That's part of this whole evaluation of, you know, is this working the way it's supposed to, is it capturing everything it's supposed to. That determination is in the works right now.	
66/5	Konecky	At one of our previous RAB meetings, it was probably the April one, you guys were talking about some of the things that the next ground water model would include like more detailed sensitivity analysis, describing all of the additional outside influences, how many irrigation wells that the next ground water model would include, and I just wonder if you could	Leibbert	Well, I'm glad you asked that question because we have addressed those questions. There's a handout on the back table where we tried to address those questions. The way the questions were written it asks for very specific detailed information. So there's a question about what does the detailed sensitivity analysis of the model consist of, how many irrigation wells will the model include, outside influences; I think we've covered the rest of them.	

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		explain to all of us what does the more detailed sensitivity analysis in the next groundwater model consist of.			
		Well, I mean just generally the sorts of things that would, you know, just generally when you do a groundwater model, I mean what -- what inputs indicate more or less sensitivity? I mean, you know, as far as like conductivity and all that kind of stuff, is that what you're referring to, or	Leibbert	Question No. 3 actually -- this fact sheet is in response to an e-mail that we got from Melissa; she had six questions. The third question that she asked was: Please describe all outside influences that the next RDGM, which is our groundwater model, will include. If you remember when we talked about the model in March, when you -- when you create a numerical model you look at as many outside influences that are present at the site you're looking at. So what this means for us is we look at natural features, such as the Platte River, such as Johnson Creek, Clear Creek, Silver Creek, Wahoo Creek, because those exert an influence over the groundwater flow and direction, we look at man-made influences such as irritation wells, both outside of the plume and also within the plume, we look at municipal supply wells like Ashland, Lincoln, and then the big one in this case, which every one is concerned about, is the MUD Platte West Well Field. So the model that we're working on right now, our groundwater model, will include all those things. Next one. One of the other questions Melissa asked in her letter to us was how many irrigation wells will the next RDGM include and how is this	

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				number arrived at? I don't have an exact number here for you tonight. The process by which that is determined is we start by going to the State of Nebraska. I think it's Nebraska DNR, Department of Natural Resources, that maintains a registered well database. So theoretically everyone in Nebraska that drills an irrigation well registers that well with the State of Nebraska, so that database can give us a location of that well and it can also give us a --I can't remember if the database has an estimated pumping rate or not. If it's not in the database then we go through other efforts to try to make our own estimates on those pumping rates, so it's kind of the first step. And what we would do is we would search the database for all irrigation wells that are in, you know, this general area. The groundwater model that URS is working on right now is actually a little bit bigger than the area covered by this map, but -- so we can talk about it. We would just look at that database and tell the database to tell us where all the irrigation wells are in this area, and then we would look at those results and we would try to identify any sort of errors or inconsistencies. Sometimes the same well is listed twice in the database, you know, so that's something that has to be fixed, those sorts of things, to make sure that they're accurate, and if there's things that we have questions about we can contact the owner of that well in the database to try to get clarifications. And then once we have all those wells identified, we try to assign them a pumping rate and a pumping schedule. We know that irrigation wells only	

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				operate during certain times of the year, so we put that information in the model, an estimated pumping schedule. We know that some irrigation wells do more, they pump more water than others, so we try to assign a pumping rate to each one of those irrigation wells. All that is part of the development of the model. As we revise the model and we do updates, the last version of this model was done in 2004, so in 2004 we went through this process. We identified all those irrigation wells in 2004. What we're doing now is to look for the differences between 2004 and 2006. Are there any new irrigations wells that have been installed since 2004; I don't know the answer to that question exactly right here at this moment. The chances are there's probably a few, and when we find those we'll include those in the new version of the model. And then the last question about sensitivity analysis about the model, sensitivity analysis is a process of basically you go through the work of creating your model and you define all of these different things, you define were all the irrigation wells are and the river and the surface water, the creeks, and, you know, everything you know about the site, hydraulic conductivity and transmissivity and storativity, and all those parameters that you gain when you do testing at the site. You put all that into the model and then once that's complete you do two things: Is you do calibration and you do sensitivity analysis. Calibration is where you tell the model to do its simulation, and then you compare those results to actual known results that you already know about the site, and the easiest	

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				example of that is water levels. The model will predict that at Monitoring Well 13 the water level should be, you know, 83 feet below ground surface. That's what the model says, and then we go out and check it, we actually go out to this well and we take a measurement, we take a reading to see what the real water level really is, and if it's close enough to what the model predicted then that tells us that the model did a good job of simulating the hydraulic properties around MW-33. So we do that across the whole site. We -- calibration's probably one of the most important things you do in developing the groundwater model, so we look to get a lot of information, like we talked about before, data from Lower Platte NRD, data from USGS; all that stuff helps us calibrate our model.	
73/18	Moorer	…you said if the actual level is close enough; what do you use as an acceptable error rate?	Leibbert	I'd have to check on exactly what it is. You can do a couple of difference statistical comparisons. You can look at linear regression, you can look at root means square. There is -- there is a threshold that, you know, general practice, you know, in the engineering community and geology community says that if it's within this range it's a good match, if it's not in this range it's not a good match. I don't know what that number is off the top of my head. We can look it up and get back to you, but I don't know what that threshold is. It's plus or minus 10 percent, something like that.	
74/9	Moorer	That's a specific question I again ask to be followed up on after this meeting and well prior to the next RAB	Leibbert	That's calibration. Sensitivity analysis is a little bit different. Sensitivity analysis is the process by which you go into the model and you artificially change different perimeters. You artificially	Calibration is an important part in the development of any numerical groundwater

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		meeting.		change the hydraulic conductivity, you artificially change transmissivity, which are aquifer properties that relate to how much water you can extract from a well and how much drawdown in the well results of that. This is something that the modeler does that again as a check against his work to make sure that the model is doing a good job of simulating what we actually see. So the sensitivity analysis modeler will go in and artificially change those perimeters, and then he'll run the simulation again and see what's different, see if he gets a different answer this time, and then he'll change a different perimeter and see if he gets a different answer, then he'll change a different perimeter and see if he gets a different answer. And you do that, the purpose of doing that is to see how does the model respond to these artificial changes, and what that looks like or what that reveals is, depending on how you constructed your model and what kind of information you've included in it, the results of that could come back and say this model is very sensitive to changes in hydraulic conductivity; that if you change the hydraulic conductivity just one little bit you get much different results from the model.	model. One step in the calibration process is to compare the actual measured water level at a specific time, and at a given location within the model domain area, to the water level that is predicted by the model for that same time and location. The model calibration is deemed to be adequate and successful when the Normalized Root Mean Square error (a standard statistical analysis technique) is less than 10%. This represents standard industry practice. When the Army (and its contractor) perform revisions and updates to the site groundwater model, this is the practice that has been, and will continue to be applied during the calibration phase of model development.
77/19	Kolb	I noticed on the Artesian	Leibbert	The Artesian Well is right here, and it is close to	The “artesian well”

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		test up there on Johnson Creek, that thing just keeps going up and up and up. Now, the TCE, I understand, just boils off into the air, but the RDX keeps going up, and where does RDX -- the test for the RDX keeps going up; where is the RDX going?		Johnson Creek and it's right in kind of the middle of this part of the plume right here. This is TCE, the blue is RDX and then this is some areas where it's co-mingled where you find both RDX and TCE. The Artesian Well is just that, and if you're not familiar with the definition of artesian conditions, it means that groundwater comes to the surface naturally at that point. One way to think about it is like a spring almost. I've not seen -- I can't remember who the Artesian Well belongs to. I've not seen it myself, but it's been described to me basically that it's a pipe stuck in the ground and groundwater comes out of the end of the pipe, and I'm not sure if -- I'm not sure how much -- I don't know if that flow rate changes over the course of the year or not. We started sampling it because we thought that it was -- we were treating it like a water supply well. We were treating it like a residential supply well, and then once we found out that it's not a supply well we made the determination that we'll handle it like a surface water result, so it gets sampled in the same group that the surface water samples gets collected on the same frequency and it gets reported that way. The results do show increasing trends over, I can't remember, the past six or past eight quarters, which is good information to have but it's within the extent of contamination, it's within the plume. It's being captured by EW-1 and 2, you know, the combination of these two extraction wells capture this part of the plume.	defined in the GMP is a misnomer. This is not a well, but merely a pipe stuck in the ground. Some parts of the year, groundwater comes out of the pipe, other times it doesn't. The pipe was dry (no water) last time we went to collect samples, therefore no sample was collected. USACE samples the groundwater from the pipe, because we are curious to see what contamination may be present in that general area. USACE understands that this water is not a drinking water source. Concentrations are probably going up because the extraction wells are pulling the contamination straight into this area, an indication that the extraction wells are working properly.

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79/10	Kolb	But the RDX is coming up to the surface, so it's boiling to the surface and running out of that property, but yet it doesn't show anything on the surface waters downstream because it's being diluted by the treated water I assume. But that water is not being caught at EW-1 or 2 because it's coming to the surface and running off as surface water – -- it's still there, but it's diluted further downstream I guess, is that all that's happening there?	Leibbert	Surface water continues to run off and drain as surface water does either through bodies like Johnson Creek or Clear Creek or through ditches that only carry water when it rains or that kind of thing, so, yes, you're correct, surface water comes to the surface and then where does it go from there? The fate of RDX in the environment is such that it will -- the concentrations that we're talking about here are actually pretty low, even though they're higher than two, they're still quite low. Every time it rains that will transport that, you know, basically all of that ends up in the surface water somewhere. It ends up in a creek somewhere. Just one thing to keep in mind is similar to the discussion we had about what's the appropriate standard, but the cleanup standard for this site for RDX is two parts per billion, and that's based on drinking water. If you were to come up with a standard for RDX that was not based on drinking water you'd come up with a number much higher similar to the example of TCE. The number for TCE by the State of Nebraska is 810 parts per billion in surface water. Nebraska does not have a surface water quality standard defined for RDX, because it's just something that doesn't appear in their regulations. But this falls into the same category as what we talked about, that is part of the surface water evaluation that we're working on with EPA right now in trying to verify what is the appropriate standard, because the drinking water is not the right standard to apply to surface water. It needs to be something else. We have one from the	

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				State of Nebraska for TCE, we don't have one for RDX; that's something that we can generate ourselves, you know, in conjunction with the agencies, that's something that is being worked on right now.	
81/15	Kolb	Back to those geoprobe wells that you have, the geoprobe tests; are you going to go back to the same GPS locations and retest those, and -- I know you're going to put down more monitoring wells, but there's still -- you can't have a monitoring well every ten feet, so are you going back and test those at the same locations, the ones that had a hit?	Leibbert	No, we won't be going back to every single geoprobe to the exact location to every single one that had a hit.	
82/1	Kolb	Why not?	Leibbert	Because if they're below action level they're below action level, but what we will do in the future in terms of investigation is go back to areas that need more -- that need more investigative work. The investigation work for this eastern perimeter is actually quite complete and we have a very good picture based on those results. Interior, on this part of the site, not so much. This is what we have to go on, it's time to update this. We'll be doing more work in this part of the site over the years, but for this part we probably don't need to be doing any more geoprobe around here. We need to install more monitoring wells along here, agreed, so that	

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				we have the capability of watching this over time, to see if it changes shape or if it changes direction.	
82/20	Kolb	Isn't that the responsibility of MUD?	Leibbert	No, actually the Army is responsible for determining the extent of contamination and verifying the extent of the contamination over time.	
83/1	Kolb	Are you going to put any extraction wells going through these tests down in the center where the stuff is really bad like EW-11, or are you going to put the wells in the – where the pollution comes from or are you just going to keep catching the edges?	Leibbert	EW-11 is a very good location in terms of there's a lot of contamination right here, so if we can put EW-11 back into service we'll be doing a good work. You know, there are high levels of contamination right there, and that'll allow us to capture that, treat it, not have a negative impact on our treatment plant and do some more cleanup action right here. Your question about will you put more extraction wells in other areas where you see high concentrations? Extraction wells, probably not; groundwater circulation wells, yes, maybe, hopefully; that's our plan, that's the intent. We didn't talk much about the – these geoprobe results. In here, in this part of the plume, that the focus is really on determining this perimeter, which we did a pretty good job of it, but these transects, these other points, reveal that there's some localized areas in here where there are very high concentrations compared to what's out here on the perimeter. Out here on the perimeter there's five or less parts per billion of TCE; in here there may be several hundred parts per billion TCE, and that's a good candidate for a location for a GCW, a groundwater circulation well. If you remember there's two groundwater circulation wells in service right now, and basically how that works is it's one well that's installed in the ground, and there's two inlets to that	If investigation data and GW modeling show some type of focused extraction will substantially reduce estimated restoration time, the Army and regulators would evaluate whether a GCW or standard extraction well would be the better option.

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				well, there's two screens, and the – the system takes water out of one screen, brings it up to the surface, brings it up into a small little miniature treatment plant, treats it right there on the spot, and then puts the treated water back into the same well, and it goes back go out into the aquifer through the -- through the other screen interval. So basically what that is, is we're getting treatment at that location but we're not taking water out of the aquifer, you know, we're not taking water away from the whole system. You know, so as a -- if we were to put a GCW right here, you know, we would put it, you know, right in the middle of a hot spot, and that water would continue to be treated over time. Another benefit of the groundwater circulation wells is that water can make multiple passes through the circulation well, it'll get sucked up, it'll get treated, it'll go back out into the formation, and it'll either get away or it'll be sucked up again. And it kind of depends on the groundwater velocity, and there's other things that can influence that, but you do get multiple treatment passes through that. So again, if you remember way back when this whole extraction well was being designed, there was a lot of concern about taking too much water out of the aquifer if we just extract it, put it in a creek, you know, then we're taking it out of the aquifer. Groundwater circulation wells are a great way to avoid that. You know, we don't have to install more extraction wells, we can do more GCWs instead.	
86/1	Kolb	How effective are those	Leibbert	The two GCWs that we have right now are actually	

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		GCWs?		working really great. As in treatment efficiency, the two GCWs have different treatment technologies. One of them is based on -- excuse me, is based on an ultraviolet treatment system, and that's for the RDX contamination. GCW-2 is over here, and this is one that treats RDX contamination, and it treats it with an ultraviolet process, and the groundwater contamination is pulled up, it goes through a small little treatment system where it's exposed to ultraviolet light. That ultraviolet light actually breaks the RDX molecules, it destroys the RDX and treats it in that fashion, so the water that goes back into the formation has been treated for RDX. GCW-1, which is up here, is a little bit different. This has a tiny little airstripper installed here, and this treats TCE contaminated water. And also, for those of you that are familiar with the site, know that there's a wind turbine here that helps power that system. That's kind of an experiment that we have going with the University of Missouri to evaluate the economics that -- does that result in any sort of cost savings by using a wind turbine to generate power to run that system. That study is in progress now, but those two GCWs actually do a very good of treating water	
87/11	Kolb	How many GCWs are planned versus regular EWs, and is there any way we can get that water that's being wasted now pumped back up somewhere in there to create a wetland or	Leibbert	Well, it -- I wasn't around five or ten years ago on this project when all this was being discussed, you know the history better than I do. The -- the water that's treated by the treatment plant right now during the summertime, almost every bit of that gets used by other people for irrigation, so that water, during those – that time of	The decision to install GCWs will be based on the results of interior plume investigations to locate potential hot-spots and GW modeling to determine

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		something rather than just wasting this water down the creek, because it's going to be factor here in a few years.		the year is not being discharged to the creek, it's not being wasted. During off times, when there's no irrigation necessary, yes, it goes back into the creeks. Can we do something different with that, can we change that? That's a bigger question than what we're going to be able to answer tonight. I don't know, you know, that's -- that decision was very long in the making, and it'll be long in the changing. But your question about how many GCWs, that is up in the air, and it kind of depends on how many different hot spots will we find across the site. And I also want to point out that GCW is a way that's been used at this site. We have these two that are working well already. There's other things you can do with TCE contamination; there's other things you can do with RDX contamination that don't require extraction wells, but GCWs is what we have so far and that's what we have experience with. So I don't have a good feeling for how many GCWs will the army install. It depends on how many hot spots we find, it depends on, you know, will it -- will it be effective. You know, there may be some areas of the site where even though you have high levels of contamination the geology may be such that the circulation wells won't work there, you won't get the extraction, excuse me, and reinjection to be able to work properly. So -- but the intent is, the plan is to start putting more of those in to treat some of these hot spots. I just can't tell you how many.	the potential impact on overall plume restoration time. If modeling shows a significant decrease in estimated restoration time, then it is worthwhile to install them. If GCWs at a specific location do not have an impact on restoration time, then they will not be installed.
89/10	Kolb	What's the time frame?	Leibbert	Well, that's another good question. So far, you	Anderson (89/11)

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				know, in the past couple of years our focus, and I think everyone else's focus has been on this eastern perimeter. Everyone is concerned about what's going to happen in the future around this part of the site. That's where all our work, all of our money has been going, is in here. To complement that, when we found this, every one knew we had a problem and everyone knew we were out of containment, and therefore not in compliance with the requirements that we're obligated to meet, so this was the No. 1 priority for a while. Now that this is basically under control, now that this is not necessarily under control but we'll have monitoring wells by the end of the year, you know, this will basically be, you know, stabilized, taken care of. So now, you know, this is okay, this is okay, now we can start shifting our focus to the interior of the plume, and see what can we do inside of here to make the cleanup better, to make the cleanup go faster, all those kinds of things.	If you look in the site management plan in Section 2, we kind of lay that out, the general time frame of when we're going to start looking at the GCWs in the interior of the plumes.
91/6	Moorer	Could you answer quickly for me what is the definition of containment that you have now finally provided? DEQ did note that that draft version that we discussed at the last meeting did not contain a definition of containment, so what is your definition of containment now in this report?	Leibbert	Very quickly before the tape runs out, definition of containment is every year we will demonstrate that the groundwater -- that the contaminated groundwater is or is not being hydraulically captured, is not -- is or is not being captured by the extraction wells that we have, so that's the definition. If we can show that, yes, all of the contaminated water that we know of is being captured by the extraction wells to everyone's satisfaction, the answer to that question is yes. If we're not able to show that the contaminated groundwater is being captured by the extraction	The definition of containment is that all of the contaminated groundwater should be inside the hydraulic capture zone (drawdown) generated by the extraction wells. Starting with 2006, USACE will make a determination about containment each year.

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				wells, then the answer to that question is no, and that's it.	The purpose is to demonstrate that the extraction wells have properly contained all of the contaminated groundwater. EPA & NDEQ will review our report every year. We use our model to help us illustrate how large the capture zone really is. But we back-up the model predictions with a lot of actual measurements and samples. We trust the model, but we collect samples and measurements to verify what the model says. We collect chemical and hydraulic data. So far, all indications are that the extraction system is working properly. (i.e. there is no contamination above action levels in areas outside the capture zone and the extraction wells continue to pump approx 2300 gpm, 24-

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					7-365)
92/3	Moorer	And so your definition of containment or contamination extends further than just what are the cleanup goals?	Leibbert	No, we're signed up to capture contaminated groundwater that exceeds the action levels that have been assigned to us.	
93/18	Moorer	Mr. Leibbert, I want to get it clear for the record here, we're talking about the containment evaluation report -- When -- and you were making characterizations about the known extent of the contamination, what you really mean is contamination that is above the cleanup goals, that's what you really mean; you don't mean all contamination, you just mean contamination that's above the cleanup goals, right?	Leibbert	Yes, that's a clarification that I need to make, is that when we talk about containing contaminated groundwater, we're talking about containing contaminated groundwater at concentrations above the action levels that have been defined for the site.	
95/5	Moorer	Mr. Anderson's response to Senator Nelson dated June 15, 2006, says, the Kansas City District Corps of Engineers with the EPA and Nebraska Department of Environmental Quality are developing a response	Leibbert	What this is meant to address is a case such as the case of MW-85. If you recall, MW-85 is down here and it's down gradient of the extraction wells and down gradient of the contamination. You can double-check me on the dates to make sure I'm correct, but what I remember is in December 2004 this well was sampled, and it had a detection of ten parts per billion of RDX, completely unheard of,	See “Response Action Process” attachment at the end of this document.

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		plan that the Corps would implement in the unlikely event the contaminated groundwater plume moves beyond the reach of the groundwater containment system now in place. These response actions are described in a document entitled the containment evaluation work plan. Okay. I've got a copy of the containment evaluation work plan that says it's draft final June 2006. So if you look in here in the section devoted to response plan -- and I have copies for other folks who want just the excerpt that I'm talking about, this is Section 4 out of the report. It's -- it's all of two pages, the response plan is all of not even quite two pages, so if somebody else is interested in seeing those, feel free to help yourself. So I'm directing your attention to a statement that you've got in here on Page -- on both Page 4.1 and 4.2.		had never been seen before at that location at that kind of concentration, took everyone by surprise; that is clearly not where contamination is supposed to be. The response -- part of the response to that was to sample that well again and to sample it on an increased frequency instead of just sampling that well once a year, to sample it three or four times a year. Since then every time we've gone back to this well it's been either nondetect or below action level. To follow up on that we did some -- a very small geoprobe investigation right in this vicinity to try to determine if there is any other contamination in the area that -- that wasn't revealed by sampling the monitoring well. This area was also covered -- it's behind the screen now, but when we did those geoprobe transects in last year -- I know it's hard to see. MW-85 is right here, there's a cluster of geoprobe points right, again to try to reconfirm that; all indications are is that there's no contamination or there's no contamination above the action level at that location, so this – this statement in the containment evaluation work plan that you just read is meant to address cases like that. There may be times in the future, five years, ten years from now, I don't know when, maybe we'll find a detection, we'll find a -- we'll sample a well out here and it'll be -- it'll have TCE above the action level, and if that happens, we want to confirm that, we want to sample that again as fast as we can to see if that's really correct. We want to do more investigation in that area to make sure that that's actually correct because there's times when	

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		You talk about trend, a clear trend. It says, if the results of the increased sampling frequency do not indicate that there is a clear trend in the results or if the original detection is not consistent or reproducible, then the sampling frequency shall be returned to the original frequency with no further action necessary. So my specific question is what do you mean by clear trend? You also use that term on Page 4.2 also.		you get unusual or unreproducible results that would lead you to a false conclusion, and you need to be able to rule those out.	
98/17	Moorer	Mr. Leibbert, may I focus you, I'm asking a basically short question or a -- something with a short answer, what constitutes a clear trend. So for example, would it take two or three or four occasions in which you see similar or rising readings, what constitutes a clear trend? Or how many -- you've given two possible	Leibbert	Well, there is no specific answer to that question.	See “Response Action Process” attachment at the end of this document.

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		definitions here but you haven't specified, you've also indicated there could be other locations in that vicinity that might indicate a trend, but how many constitute a trend; that's what I'm saying, define for me what you consider to be a clear trend?			
99/7	Moorer	Well, then why do you use this in the report? I mean, this seems to be clear, important language. I mean, this is your response plan; you say if there is a clear trend then you will do thus and such. Well, if you can't explain what a clear trend is then this is a pretty worthless plan as it pertains to use of that term.	Leibbert	Well, a clear trend would be results that would be reproducible over time, that we would see this unusual result and that would trigger our attention.	
99/19	Moorer	Over how much time?	Leibbert	Kind of depends. If it's in an area that's very near a residential well, we would probably not wait very long; if it's in a different area that poses little or no risk, we will probably wait two or three or four quarters in a row. Some of these things are affected by seasonal variations, so we have to be able to rule that out; again some of these things are ruled by inaccurate results, so you have to be able to rule that out. You know, you can't make a snap decision just based on one result one time. You have to be	

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				able to reproduce that result over and over again before deciding to take action on it; that's the intent, that's what this plan is trying to lay out.	
101/4	Moorer	One last question related to that. The last sentence of this says, any --this is when you finally get to the tier that says when you take action. The first, they have to confirm the results, and keep confirming and confirming and confirming, and then the next tier is they investigate, finally the third tier is taking action. And then they conclude and say any such action would be developed according to the routine and appropriate design process, and would also be developed in conjunction with the appropriate regulatory agencies. I'd like you to explain to me, Mr. Leibbert, or somebody else from the Corps, what does it mean that an action would be developed according to the routine and appropriate design process?	Leibbert	So if you're familiar with this site you may be familiar with the detail that the site is regulated by CERCLA, which is a series of environmental laws that dictate how and why and when you cleanup sites like this. CERCLA has a very clear process on how you go about defining a remedy, how you go about selecting a remedy, and prior to that, how you go about investigating a site. The CERCLA process is basically you investigate to determine the problem, you design a remedy that is meant to address the problem, and then you go out and implement that remedy. That process is clearly defined, and that's what this sentence is referring to when it talks about the routine and appropriate design process. We can clarify that if it needs clarification, but between us and EPA and DEQ, we know what that process is, and that process is just as I explained; you evaluate the problem, you work together to determine a solution, and then the responsible party implements that solution.	See “Response Action Process” attachment at the end of this document.

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103/2	Moorer	Is it fair to say that from your view, routine and appropriate design process means the CERCLA process?	Leibbert	Yeah, everything we do at the site is governed by the CERCLA.	
103/7	Moorer	I simply want to know does routine and appropriate design mean in your view the CERCLA process, is that what that is intended to convey?	Anderson	What it's intended to convey is that you don't rush out there and throw a remedy in without giving it some type of deliberate design process, where we -- you try to find -- you come up with the best remedy for the situation and you design appropriately, taking into account all the data, geology, all the right technology, and once that's designed it has to be reviewed and concurred with the regulatory agencies; that is what we mean by the routine design process.	
103/23	Moorer	Where does this report, if any -- where in this report, if anywhere in it, does it deal with your preparedness for situations that are not routine?	Leibbert	Well, that's exactly what this report speaks to is if and when there's a time when there's a detection of contamination above the defined action levels in an area outside of the known extent of contamination, basically what that means is if we see contamination somewhere where it's not supposed to be, that's the trigger.	
104/13	Moorer	The question is your preparedness for things that not routine, Mr. Leibbert, things that are unusual, surprises. My question has to do with things that suddenly are of a higher urgency than you've ever dealt with	Anderson	That's what this is, by finding contamination outside of the known or expected to be, that is not routine. That's an unusual occurrence, and this is the response action that we would take if something were to be found out of -- out of what we're signed up to do according to the ROD, according to the way our system operates. If there's an emergency situation like such as a residential well is found to be contaminated above the action level, then we immediately, without consultation with the	See “Response Action Process” attachment at the end of this document.

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		before; where is your plan that describes how you're going to deal with that?		regulators, without anybody giving any blessing, we put in an alternate water supply, some type of bottled water or home treatment system.	
105/11	Moorer	Are you prepared to provide an alternate water supply to the city of Lincoln?	Anderson	That's a huge hypothetical question that I'm not going to address tonight.	
106/5	Moorer	I want to ask you about Figure 1.3 in this report. It's entitled extraction well system target capture zone, and on the western part of this site it shows as the extended plume down on Load Line 1,this little orange extent of the plume as the legion describes it to be, but I noticed that the dashed lines, which are supposed to be the target capture zone, don't go as far south as the plume extends, so that at least indicates to me that your target capture zone is not as far south as the plume is known to extend at this time. So can you explain to me why the target capture zone is not as far as the plume?	Leibbert	That's kind of an error on that figure. The intent is to capture all contaminated groundwater at levels above the clean-up goals for this site. Our determination on how well we're doing that down here around Load Line 1 is in progress this year and will be documented next year as part of the annual remedy performance report as we talked about in response to Harold's question. All indications are that EW-12 is doing a good job all by itself and may be capable of capturing all this contamination all by itself.	EW-12 and the associated treatment facility are undergoing the required one-year evaluation process. During this time, all aspects of operation, maintenance, hydraulic influence and chemical sampling are assessed to determine overall effectiveness of the system. At the end of this period, the Army will prepare a report describing the system operation and any modifications if necessary.
107/6	Moorer	Mr. Leibbert, before you	Leibbert	Yes	

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		keep going on, I'm just -- is the short answer to the question it was a mistake and that you do plan to try to include the entire extent of the plume within your target capture zone?			
107/14	McReynolds	We've talked about 85 down here, and, you know, when you're discussing it, it came out five times the limit when it came on the map, and there's a couple residential places there, 32 and 34, real close, and then it's been up the road there on County Road 52A for -- I've looked it up in the library for 13 years, probably longer, and they've been from five to eight, they've been over the limit all that time, and it probably is today, it could be ten. So, you know, it's in that area, and you say nondetect, well, it's never been nondetect after you found it. Maybe it's been a lower level, but you're finding it at two levels at 85, and you never say that	Leibbert	Well, it's below the safe drinking water level.	

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		unless we ask you, and you say, yeah, it's at two levels, the monitoring well at 85. It's never completely gone away, has it?			
108/8	McReynolds	Yeah, but it wasn't at one time, it was five times the limit.	Leibbert	Well, that result has never been reproduced. We went back to that same location.	
108/15	McReynolds	Where did it go, it could have went farther south? But did it go east, did it go straight east? We know it's north, it's all the way north for a long way, RDX.	Leibbert	These wells get sampled, 32 and 34, the two residential wells that you pointed out, that have been sampled These results are to the west, to the north, to the east and the south of MW-85.	
109/3	McReynolds	You haven't found it at any level?	Leibbert	Well, I'm not going to say not at any level, I'm going to say below the site cleanup level, which is the same as the safe drinking water level…. Below the action level	
109/11	McReynolds	So you're telling us right now, Scott, that there's no worry?	Marquess	I'm telling you that the safe drinking water level, the level that's safe to drink, is two and below.	
109/16	McReynolds	Scott, while you're on this, why did that show up five times the level one time, and how come it's at two levels where it didn't use to be at two levels? It's a bigger concern that	Marquess	I'm not sure I can address -- I can't tell you why it showed up at ten, I don't have an explanation. Possible explanations could be laboratory or sampling artifacts, error, lab error, the sampling cross-contamination. That'd still be speculative, but I don't have an answer. Right, both are below two.	

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		it's at two levels rather than one even though it's below the action level? When you first found it was only at one depth, now it's at two different depths. But it's below the action level but it's there.			
110/22	Luetkenhaus	I noticed there wasn't a very big crowd here this evening, was this RAB meeting notified in the paper? Was a notice put in the papers, local papers?	O'Hara	These were sent out to all the news wires notifying this meeting last week.	
	Luetkenhaus	Platte River is as low as I've seen it in 40 years right now. This rain might bring it up a little bit, otherwise I look in about three weeks it's going to be dry, okay. You're going to run an updated groundwater model, in September it'll be completed, right?	Leibbert	Yes	
111/23	Luetkenhaus	Our next RAB meeting is October 19th, can we have a drawdown map of MUD pumping 104 million gallons a day when the	Leibbert	Well, what I'll say is by the next RAB meeting we're not going to have a drawdown map that shows MUD pumping at 104 million gallons a day and the Platte River going dry; that's not the intent, that's not what our model is meant to do. Our model	The report titled Phase II Platte West Well Field/Groundwater Modeling Study, prepared by HDR for

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		Platte runs dry, 30 days after it runs dry, and 60 days after it runs dry? Can't do that because it'll look so bad after last night, the junk that's in the university there, that drawdown map is going to go clear through that university site where all that let's just call it bad stuff is, and we don't want the public to know about that, correct?		is to help us manage this site, and our focus is on the remediation, the cleanup of this site, and that's what our model is meant to do. It's meant to help us do that. The model includes the Platte West Well Field and it includes the Platte River because those are the features that are hydraulically important, you have to include those whenever you talk about this site. But I'm not going to make the model pump the Platte River dry, I can get that, but it'd be completely false, but I'm not going to do that. I'm not going to make my model do something that's not appropriate.	M.U.D. contains drawdown maps for a number of different pumping conditions that were simulated by the M.U.D model. Please refer to that report and other documents published by M.U.D. to find information regarding the operations of the Platte West Well Field.
117/15	McReynolds	…you've got to take all of the scenarios and put them in there because it can happen. What do you think, Larry? I mean, when they start pumping 104 do you want to say something to this, Larry, what's going to happen?	Angle	Their annual average is supposed to be 52. …there's irrigation wells, et cetera, and that's one of my concerns is again low flow and what's going to happen at that condition. I wish I knew more about modeling, but they always say you should use like an annual average kind of thing, but I'm more concerned about with the transient conditions, and so I don't know, that's a very good question and I wish I could answer that.	
118/14	Moorer	What month of data will the Corps use in calibrating its next RDGM? Which months? What do you consider spring, what month for spring and what	Leibbert	We've looked at that ourselves, and we're going to try to do two different calibration targets: We're going to try to do a calibration target in the spring and a calibration target in the fall. The spring coordinated event is usually in March, and August is – you know, I'll just say that exactly what month is less important than trying to get	

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		month for fall?		something that's representative of the whole irrigation season. So if August is the best month, if August is the most representative of the irrigation season that's what we'll use. If it's not August, if it's something else, then we'll use that instead.	
120/9	Moorer	I asked why this big map that you've got on the north wall is an outdated map. I -- and I respectfully request that the maps that you bring us be current maps. There's -- it's worthless or virtually worthless to be giving us presentations on maps that are outdated. I did note that the more of an aerial photo type map that's in the containment evaluation report is a good one, and I'm suggesting – I suggested and requested, I want this to be on the record so you will at a minimum have a record of this in case you should actually look at the transcripts, that that is a good layout, and if you could thicken the lines, the colored lines that show the extent of the plume, that is one of the better visual	Leibbert	I'll go on record by saying thanks for that suggestion. I'll also go on record by saying that this map is convenient to speak from because it's so large and everyone can see it. We do provide updated maps every RAB. Those are updated, those are updated, everything we put in the reports and put in the library is updated. This one isn't changed from month to month because it's not necessary to, because we publish updated results in other forms.	At the October 26, 2006 RAB Meeting, the Army will brief from a revised large wall map that will present a comparison of the most current investigation and routine quarterly sampling results to the previous depiction of the plume as it was known in 1997. Other maps, including those with aerial depictions and those reflecting quarterly groundwater monitoring activities will also be displayed at the meeting.

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		layouts, and I request that an updated version of that map be used at the next RAB meeting, and don't use outdated maps, please.			
122/1	Konecky	You guys sampled four residential wells then since the last RAB; is that right? Were they new wells that hadn't been tested before, or why were there just four?	Leibbert	Yes. The sample schedule is different for every well. Four were sampled in the -- you were talking about the June sampling event, that's what was scheduled. They're not new or unusual, they're four wells that have been sampled again in the past or have been sampled previously in the past. Next quarter we'll do a different set of wells, the quarter after that we'll do a different set of wells, the quarter after that we'll do a different set of wells. The four wells that were sampled in June, that was part of the regular schedule, and there's nothing unusual about that.	
122/22	Konecky	Is it the ones that are closer to the plumes, you sample more frequently then or --	Bigelow Leibbert	They're in the plume. Well, Brady can look it up and tell us exactly which four wells we're talking about. I believe it's some of these that are in the plume. And Brady, if you can look what's the frequency that we do those wells.	USACE has reviewed all information provided by the community regarding locations of residential supply wells within the 1 mile zone. We welcome any new information that the community can provide. We continue

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					to monitor the area for new construction, and occasionally review county records looking for new construction permits that may lead us to a new residence that we didn't already know about. This is an on-going process, and we want to know when there is someone new within the 1 mile line.
123/19	Moorer	When are you going to provide the complete site management plan in large print including the schedule as you've promised? When specifically are you going to provide it?	Anderson	Well, we can -- it's just a matter of how we print it. If this is something that we want to discuss at the next RAB, we can do that, or if certain individuals would like us to mail them a hard copy on something larger, we can do that too. Just by putting it on the web doesn't necessarily mean it's in a bigger font or anything; it has to be printed out in hard copy and distributed. So would you like us to mail -- mail them to certain individuals or whoever requests it or –	
124/19	Moorer	At a minimum, what my request is, is that you provide a large copy to anybody who -- and mail it to them within a week of this meeting in large print for anybody who requests it, and I'm one who is requesting it.	Anderson	Tom O'Hara will get a list of those that would like a hard copy in the large font, and we'll mail them out when we get back to the office.	Large print site management plans and schedules were sent to Lynn Moorer and Dave McReynolds on 17 AUG 06. These were the only two individuals requesting these items.

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125/21	McReynolds	I want to clarify on the residents that's turned in. There was 25 different people that turned in, and as far as I know, none of them have been checked, and all of them were within a mile and a half to two miles. You know, County Road 6 and all that area across the bottom, and it was told to me about ten months ago, we didn't have enough monitoring wells over there on the west side, it slipped through, so this could slip through, and so some of these -- It'd be nice if some of those 25 were checked because it could slip through and be at them today, and it's going to be around 50 to a hundred more years, and it's going to slip through if you guys don't work harder, and it'd sure be nice to check some of the residential, and they're real close. Some of them are a mile and a half. You know, here's the list, you put it out; you just check that list and see if	Leibbert	We'll take it and we'll double-check, and if they're within the mile [buffer zone]	

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		they aren't within a mile and a half to two miles, and I need that back. You said that, you brought it here and put it out. All these people request it, you know.			
127/6	McReynolds	Now, did you -- did you put that out and give it us to here? I picked it up here at the meeting, a RAB meeting, right?	Leibbert Anderson	Dave, I'll tell you, that list is not familiar to me, and I don't know if that was something that was produced by the Army Corps of Engineers, but we'll take that list and we'll look at each one of those locations and we'll verify whether they're in or out of the one-mile zone, and if they're in we'll include them in the sampling from now on, and if they're out we'll keep it This was a -- this was something that was developed over a year ago, and it seemed to be fairly acceptable that we go out to this one-mile buffer zone from the known edge of the regulatory limit This seemed to -- everyone seemed to agree this was a good thing, and we've been diligently sampling everything within that one-mile buffer zone.	USACE has reviewed all information provided by the community regarding locations of residential supply wells within the 1 mile zone. We welcome any new information that the community can provide. We continue to monitor the area for new construction, and occasionally review county records looking for new construction permits that may lead us to a new residence that we didn't already know about. This is an on-going process, and we want to know when there is someone new within the 1 mile line.
129/4	Humlicek	I just wonder how come	Leibbert	We do sample all of these domestic wells. All of	

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		you can't use domestic wells for monitoring?		these green locations are domestic wells, those are private residents, and we do those either once or twice a year depending on how they close they are to the plume. In responding to Victor's question, all of these green wells are residential wells, and they're sampled either once or twice a year depending on how close they are to the extent of contamination. So that's important for us, we want to be able to confirm that no one's residential well has been contaminated above the safe water levels, but it also helps us understand where the plume may be moving, so we do use that information, we do sample all those wells.	
130/3	Moorer	The first one is will you get the meeting transcripts on the web site no later than 45 days after each RAB meeting?	Anderson	We'll have the raw transcript in probably about two weeks, but we go through the transcript to correct any technical errors, make sure the right technical phrase or word is in there, and spellings are corrected and things like that, and that takes us probably another two weeks, so our goal will be get them up on the web site within 30 days.	Transcripts were emailed to community members on August 11, 2006 and posted to the web site on August 20th. A hard copy and DVD of the RAB meeting were placed in the Mead Library on August 24th. The DVD and the transcript file were also loaded onto the project library computer.
131/6	Moorer	What are your plans with respect to coordinating with General Dynamic and	Anderson	I'm not really going to go into discussions with other -- that regard other PRPs at the site, those are potentially responsible parties.	

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		Dow Chemical in terms of their sampling and analysis for TCE on the site?			
131/14	Moorer	Well, a question is are your activities -- are your plans taking into account, recognizing that there may be activities by other PRPs at the site at -- apparently as it relates to TCE? We've been talking about site management plan here, so that's a basic question that you can answer. Are you taking into account or factoring in other activities that they may be taking with respect to the site? I'm referring specifically to a January 27, 2006, report prepared by Brown and Caldwell --	Anderson	No	
132/3	Moorer	… on behalf of Dow Chemical and General Dynamic. You're not taking any of their potential actions into account?	Anderson	No No	
132/9	Moorer	Do you anticipate doing that at some point in the future if an agreement is	Marquess	The site management plan assumes the Corps is going to take care of all the response actions, TCE, RDX, the whole nine yards for OU2 groundwater,	

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		signed?		so to the extent any additional -- they can get additional contribution from another party, the work that's been looked at thus far is very limited in scope, so it'd be the first of -- hopefully the first of a more substantial involvement on their part, so -- but the site management plan has the Corps doing all the work at this point.	
132/24	Moorer	So it'd be fair to say it's envisioned only that you'd be going after – going after these two other PRPs for contributions?	Marquess	I don't think we could characterize it in that fashion, no. I believe it would be their intent to do work.	
133/9	Moorer	Anyhow just to clarify then, you're -- EPA anticipates that if an agreement is signed with other PRPs it would involve more than just contribution; it would involve actual work cleanup at the site?	Marquess	At this point it's only investigatory in nature. We would envision that in the future it could very likely go beyond that in terms of their level of involvement, in terms of work, yes. But since that hasn't been scoped out yet, that's why the Corps is still planning to go with the whole -- taking care of the entirety of the problem.	
133/23	Moorer	So what are these PRPs -- what are General Dynamic and Dow Chemical looking at, what's their specific focus right now?	Marquess	And you see in the work plan, its limited scope, at this point looking at evaluating the potential for dense non-aqueous phase liquids in the groundwater on the – Well, it will be TCE in general ultimately, but they're starting at Load Line one. To lead towards a – the next step would be pilot studies for different kinds of remediation systems for TCE and groundwater.	

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	Moorer	Do you have any idea of a rough time line for reaching agreement with them so that we have some -- we can say, okay, an agreement is in place, and then we start looking for plans beyond that?	Marquess	Well, the plan was for them to implement -- to have an agreement and implement the work in the plan that you've seen this summer, so I think we're on track to do that.	

RESPONSE ACTION PROCESS IN THE EVENT OF CONTAINMENT LOSS

In the unlikely event that contaminated groundwater containment is not contained, the Army will undertake the following response action process to eliminate exposure of to humans and restore containment of the plume.

Response actions and time frames described in this section take into consideration regional and local groundwater velocities. In the project area, the natural gradient (northwest to southeast) results in an approximate average groundwater velocity of 2 feet/day, or around 730 feet/year. Contamination in the groundwater moves more slowly, on the average of 1.5 feet/day or around 550 feet/year. For example, it likely took the TCE contamination in the eastern plume approximately 40 years to move from the source area in the north to the Extraction Well 1 in the south. Contamination does not easily move across the natural gradient.

Tier 1 Actions:

If detection(s) of ROD Contaminants of Concern above action levels occur in a single monitoring well (MW) or water supply well (WSW) outside of the known extent of contamination, then:

- If detection above action level occurs in a private WSW, immediately supply the residence with alternate water supply (bottled water or carbon filtration system). Continue to sample WSW quarterly.
- If detection occurs in a MW, resample that MW immediately upon receipt of (validated) data;
- place that MW on a quarterly sampling schedule for a 2 year period;
- include resampling of any nearby MW, as appropriate, if within close proximity to the MW with the exceedance;
- any detects above action levels in that MW (or adjacent MW) within the 2 year period triggers escalation to Tier 2 actions;

- escalation to Tier 2 actions may be triggered if more than one MW is impacted above action levels, or if the magnitude of exceedances is "high" (i.e. TCE or RDX > 25 ppb)

Tier 1 Time Frames

- Escalation from Tier 1 to Tier 2 is highly dependent upon sampling results. Escalation could occur immediately upon reaching specific criteria above. Valid sampling results are available 60-90 days after sample collection.
- Provision of alternate water supply to residential WSWs takes 1-2 weeks for bottled water and 1-2 months for a carbon filtration unit.

Tier 2 Actions:

Upon meeting conditions outlined in Tier 1:

- Conduct direct push groundwater investigations and/or install additional MW in areas near the MW where the exceedance(s) were detected;
- Hydraulic evaluation of vicinity groundwater which could include installation and monitoring of temporary pieziometers, aquifer testing, and additional modeling specific to the area in question.
- If Tier 2 investigation shows plume movement beyond the original known extent of contamination that may impact water supply wells, move to Tier 3 action;
- If Tier 2 investigation shows that the plume may migrate beyond the capture zone (break containment), move to Tier 3 action;
- If plume movement does not threaten water supply wells and will remain within the capture zone of the extraction network, Tier 3 action is not warranted. Continue monitoring the MW on a quarterly basis for one year.

Tier 2 Time Frame. Upon escalation to Tier 2 investigations, 6-9 months are required to properly plan and implement field work, and evaluate data.

Tier 3 Actions:

Upon meeting conditions outlined in Tier 2:

- Provide alternate water or filtered water to impacted residents per the OU2 ROD (contamination exceeding action levels). Time to implement: 1-2 weeks.
- Take abatement actions to mitigate plume movement, such as, but not necessarily limited to:
    - Modifying pumping rates of existing EWs. Time to implement: 3-6 months

- Adding pumping/cleanup capacity (such as EWs or groundwater circulation wells (GCWs) to augment the EW network. Time to implement: 9-18 months.
- Consulting with the regulatory agencies to implement alternate groundwater remediation techniques as appropriate.
- Consulting with well operators in the area where the operations of such wells may have a negative impact on the performance of the OU2 remedy, to modify their pumping operations, as appropriate. Time to implement: Indeterminate.